

In yet another embodiment, a ball valve element is disclosed and comprises a ball segment having a substantially spherical outer surface, a top segment on a front edge of the ball segment and defining a top segment centerline, a pair of flaring segments defining a first leading edge on the ball segment, the flaring segments being symmetric to each other about the top segment centerline, and a pair of descending segments adjacent the flaring segments and symmetric to each other about the top segment centerline. The pair of descending segments are formed by the intersection of the outer surface, with a first inner surface of the ball segment. The pair of flaring segments may be formed by the intersection of the outer surface with a second inner surface of the ball segment.

The details of one or more embodiments of the invention are set forth in the accompanying drawings and the description below. Other features, objects, and advantages of the invention will be apparent from the description and drawings, and from the claims.

DESCRIPTION OF DRAWINGS

Figure 1 is a perspective view of a prior art control valve ball.

Figure 2 is a perspective view of a control valve having dual characteristics.

Figures 3a-3^c are side, end, and perspective views of a control valve having dual characteristics.

Figure 4 shows cut-away perspective views and end views of a dual characteristic ball valve illustrating the control valve ball in various angles of rotation and corresponding end views illustrating the control ball in corresponding angles of rotation.

Figure 5 shows a cut-away view of a ball valve assembly.

Like reference symbols in the various drawings indicate like elements.

DETAILED DESCRIPTION

Figure 1 is a perspective view of a prior art control ball element 10, showing some of the general features of a ball element. A ball segment 11 is formed from a thickness of material on one side of ball element 10. Ball segment 11 has a generally spherical convex outer surface 12, which allows the control ball element to rotate smoothly within a valve body (not shown). A flow passage 13 extends from one side to the opposite side of ball segment 11—the upstream to the downstream side when the ball is open. The inner surface 24 of ball segment 11 may take a convex form that generally matches the form of outer surface 12, so that ball segment 11 has a